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THE AMERICAN SOCIETY OF DENTISTRY FOR CHILDREN

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from your president's pen

I am sure that the members who were present at our well attended A.S.D.C. Convention, will attest to the fact it was one of the finest our Organization has had. We are indeed most grateful to the Annual Meeting Committee directed by Paul M. Weber and his Co-Chairman Louis E. Greenwald for such a commendable program.

Our growing Society, which now comprises 38 State Units, had the honor of adding the Idaho State Unit this past year. It is my sincere desire that as we grow in number so shall such growth be reflected in a determined effort by our State Units to promote better educational programs. I feel confident that with your enthusiastic and loyal support, we will accomplish our goal—Better Dental Health for Children.

LAWRENCE R. BURDGE

American Society of Dentistry for Children

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Pedodontics by Television

Editor's note:

The seven short papers which follow, represent the spoken phase of the television program presented at our Annual Meeting of 1956 at Atlantic City by members of the staff of Children's Hospital, Philadelphia, M. Michael Cohen of Boston and Sidney I. Kohn of New Jersey.

A.E.S.

INTRODUCTION OF PROGRAM AND PERSONNEL

SIDNEY I. KOHN, D.D.S.*

GOOD morning, and welcome to the opening scientific session of the 25th annual meeting of the American Society of Dentistry For Children. The over-all program for this meeting might well be titled "A Quarter of a Century of Progress in Dental Care For the Child." It is indeed a tribute to our present leadership and to the vision and farsightedness of the founders of this society who, from the outset, were dedicated to the building of a body of pedodontic knowledge and to the promotion of more and better dentistry for children thru professional and lay education; the ultimate goal being complete dental care for all children in the office or clinic. The advancement of public health dentistry, the increased stature of undergraduate, postgraduate and graduate pedodontic teaching, the remarkable growth of the American Society of Dentistry For Children and its fine journal, the establishment of the American Board of Pedodontics, the American Academy of Pedodontics, and your very presence at this meeting all attest to the fact that much progress has been made in this direction. More recently we have recognized and focused our attention upon a considerable number of children who, because of certain unfortunate handicapping conditions or unusual behavioral characteristics, cannot be satisfactorily managed and treated as routine "chair patients" in the dental office. Thanks to the pioneering efforts and interest of some of our pedodontic people and the wholehearted cooperation of our medical colleagues, we have come to realize that complete dental treatment for these children is no longer in the realm of wishful thinking.

* Professor of Pedodontics, Fairleigh Dickinson University, School of Dentistry.

We hope that what you are about to hear and observe this morning will serve to broaden your pedodontic concepts and encourage you to extend the services you are now rendering by enabling you to care for many children who might otherwise go dentally unattended. Surely you will be exposed to a most splendid example of medical-dental team work and cooperation, demonstrated by a group of outstanding and widely recognized physicians and dentists. I know that they would be embarassed if I were to tell you how very generous they have been in developing this program for you. However, I feel that you should know that this group has perhaps contributed more than any other group in this Country toward the scientific development of this phase of dental health service for the child.

It gives me great pleasure at this time to introduce the participants in this morning's program, the medical-dental personnel of the Children's Hospital of Philadelphia.

Robert Kaye, M.D., John W. Hope, M.D., Raymond Werther, D.D.S., Leonard Bachman, M.D., C. Everett Koop, M.D., and Manuel M. Album, D.D.S.

Medical-Dental Relationship to the Child Patient

C. EVERETT KOOP, M.D.*

THOSE of us who devote all of our professional endeavors to the care of children realize quite early in our experience that a child is not a small adult and when he is treated as such, his response to surgery does not come up to expectation.

The child differs from the adult in the character and variety of lesions presented for care and correction. His physiologic response to trauma, blood loss, and so forth is quite different from the adult response to the same insult. Psychologically, the child is almost as different as one could imagine from his adult counterpart with the same medical problem.

If these differences are real for the normal child, they are much more so for the handicapped child. The specific pediatric dental situation is complicated by an associated medical, mental, orthopedic, or neurologic handicap. The very presence of this handicap alters the physiologic response and demands the most skillful psychological management of the child in his peculiar situation.

A hospital experience for elective dental surgery in a handicapped child need not be an unpleasant one for a child. It is rather important that such not be the case, not only in reference to the dental hospitalization, but also with regard to his necessary frequent future hospital experiences for medical or dental purposes.

Ideally, we believe that a hospital experience should be one which the child would not mind repeating should the need arise. The child who enters a hospital such as ours properly prepared for that which he will encounter is almost invariably a happy one. On the other hand, the child who has not been told what to expect or who has been told a falsehood concerning his admission is suspicious, not only of his parents, but also of the doctors and nurses. It is almost never possible in a short hospital stay to win such a child's confidence and, on his departure, he takes with him only unhappy memories about an experience which might have been both pleasant and instructive. A hospital, a physician, or a dentist should never be held out to a child as a threat or a form of punishment. He should be told the truth about those things which will happen to him, although it is not usually necessary to go into great detail.

When a child is approached in honesty, his confidence is gained and his cooperation becomes a matter of course. For example, if we must undertake a painful procedure on a child such as a needle puncture for a blood specimen, we do not say, "This will not hurt." Rather, we say something like this: "We have to do a test on your blood and must take the blood from your arm with this needle. It will hurt, but just for a minute. As soon as it is over, you will realize that many things that happened to you yesterday hurt much more than that, and you never even cried." Usually, when some completely painless procedure must then be undertaken such as an x-ray, we can say, "This will not hurt", and the child believes us.

In preparing a child to come into the hospital, his parents should not begin too many days in advance of the admission date. Several days will usually suffice and a child should not be told too many new

* Surgeon-in-Chief, Children's Hospital.

things at one time. He should know something of the duration of his stay and he should know whether or not he will be staying with his mother or with other children. Above all, promises should not be made which cannot be kept by the hospital staff.

Fear of hospitalization is largely fear of the unknown or the unexpected. This applies both to parent and to child. It applies even more so to the handicapped child because both youngster and parent have been conditioned repeatedly through previous medical experience to look for the worst. For this reason with any child and, again, particularly with the handicapped child, every member of the hospital team must be aware of the importance of these principles and well acquainted with how they might best be carried out.

Children are quite sensitive and quickly sense if the parent feels that something is wrong or is to be dreaded. It is also surprising how they can detect uncertainty in the part of an inexperienced resident or intern and how quickly they gather security from a self-confident attendant.

One of the best ways to overcome apprehension on the part of the family is for you to discuss with the parents exactly what they may expect so that they in turn can inform the child. The child depends upon his parents for support in meeting any new situation, and they can be of great service to him and to you by lending him the confidence which they have learned by facing the new situation squarely as you present it to them.

There are two special areas which require discussion. First of all, the relationship of pre-anesthetic preparation of the child, and this Dr. Bachman will discuss with you in a few minutes. Secondly, the relationship of the child's surgical or dental problem in reference to his over-all medical status, and this important aspect of the situation will be discussed by Dr. Robert Kaye.

The post-anesthetic recovery time is one of confusion for the youngster. Unlike adults, children rarely have prolonged nausea post-operatively and if they do not expect nausea, they frequently do not experience it. Post-operative care varies considerably, depending upon the type of surgical procedure, although it becomes rather stereotyped for most dental operations. We have found, in general, that a child who has been properly instructed regarding the operation itself accepts the postoperative care without hesitation as it is explained to him at the time. We strongly believe that a child's care is the responsibility of the team consisting of the parent, physician, the nursing staff, anesthetist, and you, as the operating dentist. Your own surgical task can be made extremely simple if you take the time to develop this team responsibility in the place where you carry out your work and if you take your time to prepare each individual family along the line I have mentioned.

The Role of the Dental Department in the Hospital

RAYMOND WERTHER, D.D.S*

DENTAL health must be considered an essential part of the total health of the individual and is particularly important when applied to the child. Modern hospitals have therefore included dental departments in their organization in the same status as other departments to enable them to provide a well rounded service.

With this objective in mind the dental department should be organized and equipped to:

1. Maintain an efficient and up to date dental service. This should include both the patients in the out-patient department in addition to the hospitalized patients. It is essential that techniques of treatment be constantly reviewed to keep them abreast with the advances in other health areas.

2. Establish facilities through which the members of the dental profession, whether in the role of students, residents, or graduates may gain further information in the recognition and treatment of systemic disease. Opportunities should also be provided to cooperate with the members of the other health services and to understand their problems. Emergency cases involving dental and adjacent structures are presented most frequently in the hospital in which members of the dental department may learn to meet and provide any necessary services.

Dental health and teaching programs should be organized for both dental and medical personnel with stress laid upon the modern advances in prevention. In many institutions the dental service may not be able to meet the needs of all patients registered in the various departments, but in all instances should meet the need of those unable to obtain adequate care elsewhere.

Either because of the lack of facilities or other factors many dental problems do not receive proper attention or may receive only limited treatment outside of hospitals. Hospital dental service is not needed for as great a number of patients as in medical practice, but for those who do deserve hospital care, the need is essential.

The patients who most frequently require dental service with hospital facilities are:

1. The mentally handicapped or physically retarded children. This is one of the most outstanding areas for those patients who cannot be handled by routine chairside methods. It is possible under prescribed hospital technics to provide an adequate service. It is undoubtedly ill-advised to impose prolonged deep anesthesia on a young patient in a private office. Even in a dental outpatient department remote from the convenience of a main operating room in a well organized hospital such a procedure should be prohibited.

2. Patients suffering from the blood dyscrasias and particularly the hemophiliac require close cooperation between the physicians and dentists while utilizing hospital facilities.

Dental service is also essential for

* Chief of Dental Service, Children's Hospital.

patients who are hospitalized for long periods of time. Much of this must be performed while patients are in bed. Orthopedic patients form a large part of this group, along with the cardiac patients.

The dental departments with their facilities for prosthetics, operative dentistry and orthodontics are essential in those programs which have been established for the treatment of cleft palate or cleft lip. Cooperation with the other health services has done much toward alleviating the problems of these crippling conditions.

It can be readily understood that most dentists will not limit their practices only to the hospital. However, the dental practitioner should be aware of the advantages of hospital care for certain patients. All treatment, all dental teaching programs in a hospital must be on the basis of understanding and cooperation of both the dental and the other health services.

Patient Work-Up at Hospital Admittance

ROBERT KAYE, M.D.*

OPERATIVE dentistry under general anesthesia makes possible the extension of first-rate dental care to a group of patients whose intellectual, physical or emotional handicaps might otherwise deprive them of its benefits.

Desirable as the results of this type of treatment may be, we must acknowledge its elective nature and recognize the necessity for taking all reasonable precautions to safeguard the child's emotional and physical well-being before, during and after the procedure.

Dr. Koop has already emphasized the importance of the parents' giving the child a "preview" of his hospital experience, in order to minimize its impact. Within the limits of the child patient's ability to understand, it should be stressed that the procedure is being carried out for the purpose of helping him. It is important for all personnel to treat the child with kindness, substituting at all possible times sedatives and personal support, preferably from the parents, for physical restraints and force.

The object of the medical work-up at the time of admission to the hospital is to bring to light conditions present in the patient which might indicate postponement of the procedure, require correction prior to its being carried out, modify the patient's tolerance to it or suggest adjustment in the technique for carrying it out. This information can usually be brought out by careful history-taking, complete physical examination and obtaining the following routine laboratory tests; urinalysis, hemoglobin and white cell estimations. When multiple extractions are to be carried out, bleeding and coagulation times are also indicated.

We might best illustrate the importance of the medical work-up in safeguarding the patient's welfare by giving some illustrations of the type of pertinent information which might be gained as a result of carrying it out. The history might reveal allergy to penicillin, tendency to convulsions, easy occurrence of hyperpyrexis,

* Director of Clinics, Out Patient Dept. Children's Hospital.

and vascular collapse, or a tendency to bleed. Operations on patients incubating one of the viral exanthemata increase the risk of encephalitic complications.

Detection of evidence of upper respiratory infection requires postponement of operation until its resolution because of the increased hazard in these patients of obstruction to the air-way as well as the likelihood of the procedure's increasing the spread and severity of the infection.

Capricious eating habits, frequent in retarded or disturbed children, increase the frequency of iron deficiency anemias. The greater burden on the circulatory apparatus imposed by anemia makes it unsafe to subject children to the additional circulatory stress of operation when the hemoglobin is less than 10 gms. (70% of normal).

The detection of evidence of certain types of congenital heart disease alerts the anesthetist to a particular need to avoid further anoxia with its adverse effects on the integrity of nervous tissue. Foreknowledge of the presence of hypertension to the anesthetist alerts him to the need for avoiding CO_2 accumulation with its attendant hypertensive effects.

Evidence of acute nephritis or active rheumatic fever requires delay in carrying out elective operative procedures because of the possibility of causing an exacerbation of the underlying illness as a result of the bacteremia which frequently accompanies extraction of infected teeth.

Full antibiotic coverage of operation is required in patients with cyanotic congenital heart disease to prevent the development of meningitis or brain abscess and in the patient with rheumatic valvular disease or ventricular septal defect to prevent bacterial endocarditis.

The neurologic status of the patient should be appraised prior to surgery to evaluate the possibility of motor weakness leading to apnea and anoxia and also to serve as a base-line for evaluation of any deleterious effects of anesthesia.

These simple measures in capable hands should permit attainment of the hoped for benefits of the operative dentistry and serve to avoid most of its pit-falls.

The Dentist in the Hospital Operating Room

M. Michael Cohen, D.M.D.*

SINCE the advent of Blue Cross and Blue Shield and their inclusion of dental services, there has been an increase in the number of dentists seeking hospital privileges. In 1949 in Massachusetts approximately 80 dentists were members of Blue Cross and Blue Shield and had courtesy hospital privileges; at present over 1000 dentists have staff or courtesy privileges. We can expect an additional increase with the growing demands for dental care of the handicapped child. This same pattern has been followed throughout the whole country.

There are many dentists who have had no training in hospital procedures and modern operating room technique. It is my intention to describe an operating room technique of the highest standard which will meet with the approval of the medically trained surgeon. There should be no compromise in operating room

* Stomatologist, Boston Floating Hospital.

technique in the treatment of the handicapped child for mouth rehabilitation when general anesthesia is employed.

Clothing

All modern operating suites have a dressing room where the dentist can undress and select a scrub suit which will fit his particular body build. This suit is made of cotton that has been laundered. Cotton has good conductive properties. Color is important, since the material should absorb light and reflect as little of it as possible. This permits maximum illumination of the operative field without constriction of the pupils and consequent fatigue of the eyes. Cotton socks are best. Nylon socks and stockings are acceptable if they are conductive without the shoes on. Nylon underwear is satisfactory if it touches the skin, but cotton underwear is preferable. Nylon petticoats may be dangerous since they are free-hanging and may become charged through motion.

Footwear

The next step is to put on a pair of conductive shoes or booties, or leather-soled shoes with conductive strips placed on the inner sole and adapted over the back of the shoes. They should be worn only in the operating room. Ordinary rubber-sole or synthetic-sole shoes may carry electrostatic charges regardless of the type of floor. The conductivity of shoes or booties should be checked on a conductometer, on arrival in the morning and again in the afternoon.

Conductive Material

Static charges may be produced by nonconductive materials. All operating room suites should have conductive floors. Many of these are of marble aggregate in a matrix having a base of cupric-oxy chloride. There are also conductive linoleums and plastic floors. All equipment should be grounded. A cigarette, open flame, photoflash, photoflood, or cautery may produce an explosion of combustible anesthetics. Personnel must be trained to stay away from the anesthesia machine and the patient's head and to move slowly at all times. Electrostatic charges may be built up by fast motion or sudden acceleration.

Headwear

The cap should cover all the hair. Turbans are more effective for women than caps and are easily made and put on.

The Surgical Mask

The mask should be washed, dried, and brushed to free it of lint. It is then placed over the nose and tied about the face. If glasses are worn a strip of soft copper or aluminum should be inserted into the hem along the upper edge of the mask and bent to conform to the nose, so that the expired air will be deflected and will not fog the lenses.

Scrubbing of Hands

The nails should be cleansed and manicured, after which every surface of the hands should be thoroughly scrubbed for

at least seven minutes. Ethyl alcohol 70 per cent—rubbing for 1 minute. Zephiran 1–1000—1 to 3 minutes. The hands and arms should be dried beginning with the fingers with a sterile towel.

Donning of Gown

The gown is passed collar uppermost by an attendant and grasped with the right hand. The collar is grasped with the left hand and is unfolded at arms length, to avoid contamination from the front of the scrub suit. The ends of the collar are grasped in either hand and the gown is shaken vigorously to open the arm holes and make them easily accessible. The gown is tossed into the air and caught by thrusting the extended hands into the sleeves. The arms are adducted across the chest and rotated outward. In this position they slide readily into the sleeves. When the fingers reach the region of the elbows they are extended and the arms are abducted. The hands then slip through the sleeves and cuffs. (Often the folds of the sleeve are stuck together and it may be necessary to wiggle the fingers to separate them). The circulating nurse grasps the back corners of the collar, pulls the gown upward and backward over the shoulders, ties the tapes in back, and smooths the gown by jerking down the bottom hem.

Donning of Gloves

The scrub nurse opens the sterile packet of gloves. The sponge containing the talcum is picked up and used as a puff to powder the hands. One of the gloves is grasped by the inverted cuff and the fingers of the opposite hand are insinuated into it. The opposite glove is picked up by slipping the gloved hand behind the inverted cuff to hold the glove while the other hand is inserted.

Significance of General Anesthesia in Operative Dentistry

MANUEL M. ALBUM, D.D.S.*

IN THE dental treatment of normal and handicapped children, we are confronted from time to time by barriers which make it difficult to carry out dental treatment in a smooth fashion.

Some dentists have no desire to treat children and consequently pay little attention to their dental needs. These children are shunted from pillar to post becoming in time dental cripples and problems for any conscientious individual attempting to do dentistry for them.

* Associate Dentist, Children's Hospital.

Bringing the child into the hospital and working on him under a prescribed technique of general anesthesia will do much toward restoring the child's faith in dentists as well as to help reeducate him in the proper care of his dental ills. The child ceases to be frightened during his future visits. Personalities change overnight for the better following the use of general anesthesia.

The youngster has no knowledge that anything has been done to his mouth from the time he leaves his bed until he returns from the operating room. The

dentist can teach the child that he has nothing to fear from the dental engine. Restoring the mouth completely at this one sitting enables the dentist to establish a starting point for future work on the child. Simple procedures such as polishing or fillings and prophylaxis can be done easily and help restore the child's confidence.

Through the use of general anesthesia for operative dentistry, all the fillings and extractions can be done at one time. In addition under this technique, all types of dental procedures can be performed. This includes pulpotomies, jacket preparation, impressions, and anything else done in our daily routine.

General anesthesia for operative work opens up new avenues to the badly handicapped youngster who because of his physical condition was deprived of good dentistry or for that matter any type of dentistry. Dentistry under this technique should be the best kind of dentistry possible. No child should settle for second rate dentistry. It should be the same as that which we would desire for our own children.

Operative dentistry in this fashion is reduced from many visits to one. This is extremely important where patients must travel long distances for treatment.

The most important thing to remember in the use of general anesthesia for operative dentistry is that it should not be used as a crutch by the dentist to make his approach to the child easier. It should be used only in those cases where it is impossible to treat youngsters under normal office procedures or through the use of premedication.

We must realize that any technique using general anesthesia is only as safe as the skill of the anesthesiologist and his knowledge and understanding of the anesthetic agents used. In addition, the proper preoperative medical evaluation as well as the postoperative care, particularly in the handicapped child, will determine success or failure with the patient.

At last through the use of general anesthesia under hospital conditions, we have a valuable adjunct for the treatment and care of children who were previously denied and neglected from a dental standpoint.

The Role of X-Rays

JOHN W. HOPE, M.D.*

THE routine x-ray examination of the chests of well children, for survey purposes, is a practice we do not subscribe to and do not approve. Using chest roentgenograms to search for cases of childhood tuberculosis is, in our opinion, the wrong approach. It is far preferable to first do a routine tuberculin test and then to follow this with chest roentgenograms of the positive reactors. This will automatically eliminate chest films in the great majority of children.

There are a number of reasons for this opinion. Perhaps the chief reason has recently been stated by a special committee of the National Academy of Science and printed in most of the newspapers in this country and repeated by TIME MAGA-

* Director of Department of Radiology, Children's Hospital.

ZINE recently. The findings of this committee came as no surprise to any radiologist. As a group, we have long been aware of the danger of radiation and we have tried to eliminate the indiscriminate use of x-rays. Certainly the "well child" is one group of our population which should not be exposed to any form of unnecessary radiation. The argument can always be given that a chest roentgenogram does not expose the patient to much radiation. This is true. However, the effect of radiation is thought to be a cumulative one, and for this reason any unnecessary radiation, regardless of how little, should be avoided.

Another reason for not taking chest films with reference to the tuberculosis problem is that the vast majority of children with positive tuberculin tests will have negative chest roentgenograms. Hence a negative chest film without a tuberculin test would give rise to a false sense of security.

For these reasons I want it firmly understood that we do not approve of routine chest surveys of "well children". The "sick child", however, is another problem entirely. A proper roentgen examination is one of the best diagnostic tools we have at our command today. To deny the "sick child" this tool would be just as wrong as its indiscriminate use in the "well child".

The type of case we are discussing today—the mentally retarded child—is a sick child. Perhaps he may not appear ill, but very often this is not known. Many of these children have been neglected or at least have not had careful periodic medical attention. Many of them are too disturbed to examine. Very few of them are able to convey their feelings. Hence while we have no difficulty in knowing when a normal child is sick, this is not the case with retarded children. For this reason we do recommend routine chest surveys of this type of patient. We have found enough unsuspected disease to make this examination worthwhile.

Congenital Dental Anomalies Occurring in 3,557 Children

JOHN M. CLAYTON, D.D.S.*

THERE are conflicting opinions (1–4) in the literature regarding the occurrence and frequency of certain dental anomalies. Since most of these reports have been case presentations, a composite picture of these anomalies has been difficult to formulate. It is the purpose of this report to present an analysis of the radiograms accumulated over the past 12 years of practice with reference to the occurrence of anomalies.

MATERIALS AND METHODS

There were 3,557 patients surveyed by the author over a 12 year period. The cases were not selected. Each patient received full mouth intra-oral roentgenograms consisting of 4 posterior and 2 anterior films. These films were examined and the occurrence of each anomaly recorded. Special attention was given to the presence of supernumerary teeth, peg teeth, missing teeth, and fused or geminated teeth.

* Visiting lecturer in Pedodontics, University of Kansas City, and member of Honorary Staff, Mercy Children's Hospital.

RESULTS

The data collected from 3,557 full mouth roentgenograms revealed that 214 children had congenitally missing teeth, 68 had supernumerary teeth with 22 in the primary dentitions, 17 had fused teeth and 12 children had peg teeth (Table 1).

TABLE 1

Number and Percent of Missing Teeth, Supernumerary Teeth, Fused Teeth, and Peg Teeth in a Group of 3,557 Boys and Girls

	No. Person	Teeth Absent		Supernumerary Teeth		Fused Teeth		Peg Teeth	
		No.	%	No.	%	No.	%	No.	%
Male	1670	217	12.87	50	2.99	9	0.59	5	0.29
Female	1887	216	11.45	30	1.58	8	0.42	7	0.37
Total	3557	433	12.14	80	2.24	17	0.47	12	0.33

Missing Teeth

There was a total of 433 missing teeth (12.14%) in the group of 3,557 boys and girls (Table 1). The occurrence by sex was almost evenly distributed (Table 1). The number of children with one or more missing teeth was 214 (6.01%). There were 82 for the 3–5 year old group, 86 for the 6–8 year old group, 34 for the 9–11 year old group, and 12 for those over 12 years of age (Table 2).

The most frequently missing permanent tooth in this group was the mandibular second bicuspid followed by the maxillary lateral and central incisors (Table 3). The most frequently missing primary tooth was the maxillary lateral followed by the central and first primary molar

TABLE 2

Age Range in 3,557 Children with One or More Permanent and Primary Tooth Anomalies

Age	No. Exam.	Absent Teeth		Supernumerary Teeth		Fused Teeth		Peg Teeth	
		No.	%	No.	%	No.	%	No.	%
3–5	1795	82	4.62	32	1.78	14	.77	4	.22
6–8	1292	86	6.73	37	2.86	2	.15	4	.30
9–11	396	34	8.58	9	2.27	1	.25	4	1.01
12 & over	74	12	16.00	1	1.35	0	0	0	0
Total	3557	214	6.01	68	1.90	17	.47	12	.33

TABLE 3

Frequency of Missing Teeth in 318 Missing Permanent Teeth

Tooth	No. Missing	Percentage
3rd Molar	3	.94
2nd Molar	3	.94
1st Molar	5	1.57
2nd Bicuspid	177	55.69
1st Bicuspid	12	3.77
Cuspid	5	1.57
Lateral	94	29.55
Central	19	5.97
Total	318	100.00

TABLE 4

Frequency of Missing Teeth in 43 Missing Primary Teeth

Tooth	No. Missing	Percent
2nd Molar	0	0
1st Molar	8	18.61
Cuspid	3	6.97
Lateral	22	51.16
Central	10	23.26
Total	43	100.00

(Table 4). In instances where more than one tooth was absent there was usually a bilateral occurrence.

Supernumerary Teeth

This group of children had a total of 80 supernumerary teeth. Fifty occurred in boys and 30 in the girls for a percentage of 2.9 and 1.5 respectively. Aberrant teeth were more frequently seen in children under 8 years of age.

Fused and Peg Teeth

Fused and peg teeth presented a small minority of tooth abnormalities, and are thus discussed together. There were 17 (0.47%) geminated teeth in the total child population. Fused teeth were more commonly found in the 3–5 year age group and were about equally distributed between males and females. Peg teeth showed no distinction as for age or sex with a total of 12 (0.33%) such teeth in this group.

Discussion

The most frequently missing teeth in this series were the mandibular second bicuspids and maxillary lateral incisors. From an evolutionary point of view, these teeth, along with the third molars (5), are vestigial organs and their absence has no clinical significance. Peg teeth were found only in the permanent teeth and occurred in both right and left maxillary lateral incisors. Supernumerary teeth were found to occur about twice as often in permanent teeth as in the primary teeth. Fused teeth usually occurred as a singular anomaly in this group of children.

Summary

A survey analysis of 3,557 full mouth roentgenograms showed the presence of the following congenital anomalies:

1. There were 214 children with 433 congenitally missing teeth, or 6% of the children had an average of 2 missing teeth.
2. A total of 68 children or 1.9% had 80 supernumerary teeth.
3. 17 children or 0.5% had 18 fused teeth.
4. 12 children or 0.3% of the total population had 12 peg teeth.

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A Critical History of the Treatment of Pulpal Exposures

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NEXT to dental caries, no particular field of interest to the dentist has caused more controversy than the dental pulp. Its ability to regenerate after perforation of its dentinal walls either by caries, or accidentally during cavity preparation, has been reported, debated, and denied by various authors, and this disagreement has led to numerous procedures for conserving the vitality of exposed pulps being advocated. It is the intention of this paper to briefly review the literature on this subject, as a possible help to anyone interested in this field of study.

It should be borne in mind that most of the publications, especially the earlier work, refer to exposures made while excavating caries, which may therefore have been either carious or accidental.

In the middle of the nineteenth century, no success was reported when the exposed pulp was touched with nitric acid, then capped with gold or quill. Taft[1] stated that his treatment of a carious exposure was to dry the cavity and place a temporary filling on the pulp, and he claimed that in 50% of the cases, a bony deposition took place and restored the continuity of the dentin. Considering the year (1860), Taft's remarks regarding the pulp were erudite, e.g.: "The pulp does not die from exposure, but from other circumstances such as contact with foreign substances, changes in temperature, etc." Westcott,[2] discussing Taft's assertions, expressed disbelief that any bone deposition could take place once the lining membrane of the pulp had been ruptured. The majority opinion was in agreement with Westcott.

Taft seemed undeterred by the adverse criticism, and recommended as a capping material "Os Artificiel," implying obviously that it was inert. The components of this substance are of interest.

Soluble Glass:

Quartz	15 parts
Potash	10 parts
Charcoal	1 part

The above dissolved in steam to make a clear syrupy fluid and mixed with a powder, the basis of which was zinc oxide.

At the American Dental Convention, 1862,[3] pulp therapy was discussed at length. Westcott again denied success in conservative pulp therapy. However, a new method using cambric dipped in zinc chloride, sealed in place with oxychloride of zinc cement, was reported successful. Hill advocated, "prickling the pulp, causing its withdrawal", and the placing of smooth-surfaced gutta percha next to the exposure.

Self-experimentation is somewhat rare in this field, but is reported by M'Kown,[4] who used creosote and tannic acid on his own exposed pulp. He had no complaints, and his methods found favor with several others, perhaps influenced by M'Kown's subjective recommendation.

1866 marks the first reported pulpotomy. Allport of Chicago suggested: "Amputation of the exposed part of the pulp is to be carried out . . ., after which the edges of the pulp are stripped from the margins of the chamber, far enough to allow the lips of the wound to fall to-

gether and heal by first intention," the suggested covering of such a wound being the blood which exuded.[5] What to do and what to use continued to be a source of debate and discussion at dental meetings, and advocated agents included lead, tin and "spunk" (agaric with niter).

Waite[6] suggested the use of phenol, and a few years later, Atkinson[7] optimistically asserted that all that was necessary for success was to coagulate the albuminous surface and subsequent operations were certain to be successful. By 1872, the situation was such that Klump[8] stated: "As to the proper mode of treatment of an exposed pulp, so wide a difference of opinion prevails, that it still seems an open question with the profession."

A rather novel capping material was suggested by Hammond,[9] who used precut cork treated with creosote and tannic acid, and made adhesive on one side. Garrettson[10] apparently recognized the effects of hyperemia, although the treatment suggested was rather drastic. It included depression of the heart rate to 55 beats per minute by the administration of bromide and "a circulatory depressant other than opium." At about the same time, celluloid and ether was proposed as a pulp capping material.[11]

Looking back on the twenty-five years just reviewed, empiricism is the obvious basis for the suggested treatments. Indeed, one could conjecture that Westcott opposed pulp capping because of his own unfortunate experiences. The various methods and materials are so strongly indicative of trial and error as to deter the more cautious from any attempt whatsoever to conserve an exposed pulp. The use of phenol is worthy of note. Comparatively recent work regarding surface necrosis will be mentioned later.

Perhaps the outstanding innovation of this era was the report on pulpotomy, and the suggestion that a blood clot be used to cover the cut surface. A recent study, almost one hundred years later, suggests an investigation into the role of blood-clotting in pulp therapy.[29]

The beginning of the next twenty-five year period was marked by a notable publication. In 1876, an admirable paper was read before the New York Odontological Society by Cravens[12] and is worthy of quotation at some length. "Carbolic acid is not a constituent of dentin. Neither is cork, nor gutta percha. . . . When the pulp has been exposed it does not ask for any caustic agent, it is already too near destruction. What it does want is bone material. . . . Pabulum, if you please, to assist in replacing lost structure." Cravens claimed that lactophosphate of lime was such a substance, and that local assimilation took place.

The proposed remedies for pulpal exposures continued to increase in number. Aseptic sponges, bichloride of mercury, asbestos and boracic acid were among many. Stellwagen (1879) used non-carious dentin scraped from the walls of the cavity on to the exposure site.[13] The name of G. V. Black[14] appeared as a supporter of zinc oxyphosphate cement, claiming that it did no harm to the exposed pulp.

After the auspicious start of this quarter century, the same pattern had been followed as before, with the exception of Stellwagen. Of all the authors, he alone seems to have listened to Craven's plea for the use of 'pabulum.' The other suggested therapies are all the more surprising, when one thinks of the great advances made in histology and medical research at this time.

By 1913,[15] one author summed up the position on conservative pulp therapy "in three indisputable statements: (1) The consensus is that, ordinarily all exposed pulps should be removed. (2) There is no

certainty that pulps exposed by caries or otherwise will remain vital under capping materials. (3) The inherently experimental character of pulp capping argues strongly in favor of the little more laborious root canal therapy."

The next ten years brought about a complete change in the attitude of the profession to this problem. Inglis,[16] commenting on this, said: "Then it took no chances and removed the pulp. Now it must take chances and try to preserve it." As a capping material he suggested 'Iodoformagen', which consisted of eugenol, phenol, iodine salts and zinc oxide. With the advent of the widespread use of x-rays, the work on pulp proceeded with increasing pace. Pulpotomy and pulpectomy were advocated with about equal fervor.

The detailed anatomy and variations of the apical foramina were shown by Hess,[17] and this led him to presume that at best, pulp extirpation was a high amputation. About this time histology was coming into its own in the study of pulp, and among the first was a report by Mueller,[18] but his treatment was mummification, rather than preservation of the vitality of the pulp. These thirty years brought about the change already noted, but still the use of phenol and suchlike drugs seemed the order of the day. Two interesting abstracts appeared in 1933[19] and 1934,[20] dealing with the action of paraformaldehyde and zinc oxide on the exposed and unexposed pulps of dogs. With 10% paraformaldehyde on the exposed pulps, severe degenerative changes in the pulp were followed by periapical involvement. However, in cavities where there was no exposure, secondary dentin was laid down with no apparent effect on the rest of the pulp. When the concentration of paraformaldehyde was increased to 25%, severe metaplastic changes took place in the pulp, and bone was formed, beneath which normal secondary dentin appeared. (This work has received scant attention in the literature. Here is a method by which the character of the calcific material laid down in the pulp is severely altered, and it seems relevant to question the modus operandi of this change, and the cellular elements involved.) At this time, Gottlieb, Orban and Stein[21] showed calcification using dentin dust application to the pulp amputation stump.

The era of calcium hydroxide dawned in the late 1930's, and numerous reports appeared.[22, 23, 24, 25] Practically all the work on the treatment of exposed pulps in the next ten years was devoted to a comparison of the effect of calcium hydroxide and zinc oxide, and undoubtedly the former received most of the support.

Zander[23] offered a hypothesis regarding the mode of action of calcium hydroxide on exposed pulps and this work is much-quoted, and apparently accepted. His reasoning was that the blood is normally saturated with calcium and phosphate ions, and that the addition of calcium would cause precipitation of calcium salts. He also points out that phosphatase is known to act best in an alkaline medium. Since the ph of calcium hydroxide is 12.4, surface necrosis is inevitable, reminiscent of Atkinson's "coagulation of the albuminous surface." In a later work, Zander and Law[25] reviewed the use of phenol, hydrogen peroxide and cautery, zinc oxide and formocresol, and zinc oxide and eugenol, and concluded that the use of such powerful antiseptic drugs in treating a wound surface was not in accordance with the methods accepted in general surgery. These authors go on to suggest the use of calcium hydroxide, calling it mild and antiseptic. It is difficult

to correlate these statements, since a ph of 12.4 does not suggest a material which is mild and soothing, nor does the area of necrosis seen in histological sections. A similar use of a solution of such alkalinity does not seem a common occurrence in the normal treatment of wounds. Rosenstein (1949)[26] reported on the results of 1232 pulp-capped primary teeth, and claimed 91% success with each of a variety of materials used, with no statistical difference between them. He concluded, therefore, that the choice of capping material is not so important as other factors in diagnosis and treatment. Unfortunately, no histological evidence was offered by the author.

Penicillin was used with zinc oxide-eugenol, and reported successful,[27] and also in conjugation with calcium carbonate on surgically exposed pulps of a rhesus monkey,[28] although the number of teeth used was rather limited.

Recently, a good deal of work has been published on pulp therapy, and although clinical in nature, an apparently almost universal pessimism prevails. Via[29] claims only 31% success, while Shoemaker[30] sums up as follows: "An operation which is successful in 39% of cases is undoubtedly better than an extraction. It appears, however, that the profession has been, and is, advocating pulpotomy with more optimism and less proof than is justified." Schroff,[31] of New Zealand, summed up the present state of understanding on this vexing subject with a quotation from Goethe: "It is only when we know very little about a subject that we can be sure; and with knowledge doubt arises and grows."

Although this review is essentially of the literature of pulp therapy in the English language, it should be borne in mind that the work published in other languages is equally voluminous and contradictory. A similar present day despondency prevails amongst contemporary German authors.[33] Perhaps the simplest way of summing up is to draw attention to Schroff's observation that the physiological aspects of the pulp have been barely touched, and that there is a wealth of knowledge 'yet to be gleaned from this virgin soil.'[32]

It is easy to look back and criticize, and sadly shake our heads at the apparently futile endeavors of our professional forbears, but we must always remember that their interest and perseverance, even in their errors, have added to our present-day knowledge.

I wish to thank Dr. Benjamin Spector, M.D., F.R.M.S., Professor of Bioanatomy and Professor of the History of Medicine, Tufts University Schools of Medicine and Dental Medicine, for his interest and very helpful criticism.

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Pulp Capping with Calcium Hydroxide and Penicillin

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THE protection of the dental pulp from injury and death is one of the purposes underlying most of our procedures in operative dentistry. The control of the damage by dental caries is aimed directly at this result. However, when the carious process has progressed so far as to reach the pulp, the health of the pulp is seriously compromised. The handling of such a situation—namely, the carious pulp exposure—then becomes directed at preserving the health of the pulp and allowing it full opportunity to heal and survive.

Methods of treating the pulp exposed by caries have occupied the attention of dentists for many years. It is of particular interest to dentists treating children. Eichenbaum and Dunn[6] found carious pulp exposures in 213 of 511 children. However, not until it was demonstrated that the exposed pulp can heal and that it can protect itself by depositing new dentin, did any real prospect of successful treatment appear. Studies by Berk[1], Berk and Cohen[2], Brindsden[3], Glass and Zander[10], Patterson and Van Huysen[17], Teuscher and Zander[27], and Zander[31] demonstrated that the pulp can heal under a dressing of calcium hydroxide. Fenner[7], Restarski[19], and Marmasse[16] demonstrated that the pulp would heal under a dressing of "Calxyl," which is a combination of calcium hydroxide (99%) and sodium, potassium and calcium chlorides, and sodium bicarbonate. Seelig, Fowler, and Tanchester[23] demonstrated that the pulp can heal under a dressing of calcium carbonate and penicillin.

In the light of such information it seemed reasonable to crystallize methods of treatment of the exposed pulp. Among these are the vital pulpotomy and pulp capping. Clinical results of varying degrees of success with both of these methods have been reported. It is the purpose of this report to describe the clinical effects in pulps exposed by caries when treated by pulp capping with calcium hydroxide and penicillin. But a discussion of the merits and shortcomings of the method of pulp capping is warranted.

Pulp capping is generally understood to mean the covering of the exposed pulp, as it remains after complete removal of carious dentine, by placement of some dressing material directly over the pulp tissue, without any further operative procedures on the pulp itself. This dressing is then protected by some suitable filling material. The principal virtue of this method is its simplicity. It is the simplest of all forms of treatment of the exposed pulp. It consumes the least amount of time. It can be carried to completion in one visit, including the placement of the filling. It involves the minimum manipulation of the pulp itself, with minimum tissue trauma. There is little problem in control of hemorrhage. There are no dressings to be changed. If such a relatively uncomplicated procedure can yield as good clinical results as the

more complex procedure of pulpotomy, its use warrants most serious consideration.

There is, however, one obstacle to acceptance of the method, and that lies in the problem of interpreting the outcome of treatment. It is difficult, if not impossible, to observe positive evidence of true healing, such as the formation of a "dentin bridge." (Such evidence frequently can be observed after vital pulpotomy.) Therefore evaluation of the results of treatment must depend on negative evidence alone—on negative radiographic findings, on persistence of normal response to thermal and electrical tests, and on the absence of objective and subjective symptoms. These criteria, of course, have a serious limitation—it is well known that a non-vital pulp may remain asymptomatic and radiographically negative for some time. The effects of this limitation, however, may be mitigated by prolonging the period of post-operative observation, so as to give more opportunity for clinical evidence of pulp death to appear. But how long should this period of observation be? This is a question that has yet to be answered. However, the same question applies to the other forms of treatment. Pulps which have formed "dentin bridges" have died at some time subsequent to the formation of such bridges. This is an experience shared by most operators who have performed vital pulpotomies.

So it appears that there is as yet no known sign, or group of signs, which will yield conclusive evidence of maintained vitality in a pulp which has been treated by any of these methods. But *some* time interval must be selected as a minimum period after which observation for results might yield valid data. This author arbitrarily chose the period of one year, and reports cases that have been followed for a minimum of that time.

Method

In this study teeth were accepted at random, as they appeared in the private practice of the author. Cases were accepted regardless of the size of the exposure. However, teeth whose pulps exhibited any evidence of impairment of vitality were excluded. History of spontaneous or prolonged pain, absence of bleeding upon exposure or probing, or presence of periapical bone changes were considered evidence of impaired vitality.

All operative treatment was carried out under local anesthesia. Carious dentin was completely removed, the cavity was irrigated with a stream of tap water and then dried. The exposed pulp was covered with a paste consisting of a mixture of calcium hydroxide and crystalline penicillin G (approximately 10,000 units) in one drop of water. In the later stages of the study the paste consisted of a methyl cellulose—calcium hydroxide suspension (Rower) with penicillin. The dressing was covered with a soft mix of zinc phosphate cement, applied without pressure. This cement was allowed to set and an amalgam filling was placed immediately.

Results

A total of 96 teeth was treated in the manner described. The results were observed periodically, and only those cases followed for a minimum of one year, or those which failed before, are reported. Of these there were 34 primary, and 49 permanent, with a total of 83 teeth. Of these 83 teeth, 7 developed acute alveolar abscess or periapical bone change; these were considered failures. Of these 7, 3

TABLE 1

Summary of Results

	Teeth Treated	Successful	%	Unsuccessful	%
Primary.....	34	31	91	3	9
Permanent..	49	45	92	4	8
Total.....	83	76	91.6	7	8.4

TABLE 2

Periods of Observation

Number of months	Total	Successful	Unsuccessful
Less than 12	4		4
12–23	30	28	2
24–35	16	16	
36–47	14	13	1
48–59	7	7	
60–71	4	4	
72–83	4	4	
84+	4	4	
Total.....	83	76	7

TABLE 3

Age Distribution of Patients

Age in Years	Total No. of Cases	Successful	Unsuccessful
0–5	7	6	1
6–10	34	32	2
11–20	16	16	
21–30	8	7	1
31–40	16	13	3
41+	2	2	
Total.....	83	76	7

were primary, 4 were permanent. These failures became apparent in ½, ¾, 1, 6, 12, 20 and 42 months. The remainder were negative to x-ray and clinical examination. This yields a degree of success of 91% in the primary teeth, and 92% in the permanent teeth, with an overall successful ratio of 91.6%. (See Table 1.)

The distribution of periods of observation is shown in Table 2. The patients ranged in age from 4 to 60 years. (See Table 3.)

Discussion

Several reports have appeared on the results of treatment of carious pulp exposure by pulp capping with various materials, followed for varying periods of time. (See Table 4.) There have been reports on the results of treatment by vital pulpotomy. (See Table 5.) The results of this study are similar to those of other studies on pulp capping, and also to those of studies on vital pulpotomy.

It has been demonstrated repeatedly through microscopic study that the pulp can heal under a calcium hydroxide dressing, as alluded to earlier. The pulp heals uniformly when it is an intact pulp —not previously exposed by caries. The failures in the treatment of cariously exposed pulps appear, then, not to be the result of any short-coming in the calcium hydroxide as a dressing material. The explanation for these failures might be found in: 1) the existence of some impairment of vitality previous to treatment; or 2) the amount of trauma the pulp is subjected to during treatment; or 3) a combination of both 1) and 2).

Present methods of examination of the pulp still fail to reveal some information which would be helpful in arriving at a diagnosis. A pulp can be completely asymptomatic and yet show microscopically varying degrees of inflammation or degeneration.[18] This is a problem faced in all methods of treatment of the exposed pulp. The operator is limited, however, to those clinical tests now available, and they revolve mainly about history of pain on various stimuli, plus the behaviour of the pulp at the time of exposure. Most investigators of this problem have used the same criteria for

TABLE 4

Studies on Pulp Capping

Author	Dressing Material	No. of Cases	Period of Observation	% Success
Chatterton[4]	Calcium hydroxide	72	1 or more yrs.	72
Fenner[7]	"Calxyl"	90	Up to 2 yrs. and more	95
Gilberg[9]	Penicillin	205	3 to 26 mo.	98
Kutscher[13]	Penicillin	154	2 wks. to 33 mo.	98
Patterson & Van Huysen[17]	Calcium hydroxide	56	Up to 25 mo.	91
Roberts[20]	Calcium hydroxide; penicillin IM	23	3 yrs.	84
Rosen[21]	Penicillin	40	4 mo.	100
Rosenstein[22]	Various cements	512	½ to 7 yrs.	90
Tannanbaum[26]	Calcium hydroxide	62	1 to 18 mo.	92
Wheeler[29]	Calcium phosphate; Calcium hydroxide	60	3 to 72 mo.	93
Wittich[30]	Calcium hydroxide, iodoform, zinc oxide, eugenol and phenol	243	½ to 4½ yrs.	87

TABLE 5

Studies on Vital Pulpotomy

Author	Dressing Material	No. of Cases	% Success
Brindsen[3]	Calcium hydroxide	30	97
Easlick[5]	Calcium hydroxide	10	80
Hess[11]	"Calxyl"	110	90
Law[14]	Calcium hydroxide	256	49
Low and Krasnow[15]	Zinc oxide, with 1% paraformaldehyde, and eugenol	101	89
Shoemaker[24]	Calcium hydroxide	28	39
Strange[25]	Calcium hydroxide	45	85
Via[28]	Calcium hydroxide	103	31
Zander[31]	Calcium hydroxide	150	71

selection of cases for treatment. These, in substance, can be reduced to this—any impairment of vitality of the pulp contraindicates treatment which is aimed at preserving the vitality of the pulp. This policy guided the selection of cases in this study also.

It has been demonstrated that the pulp, at the site of carious exposure, exhibits a local area of inflammation. The process of pulp capping usually allows this inflamed portion to remain, and trauma to the pulp is kept at a minimum. With this local area of inflammation still remaining, the pulp may be able to recover from its total injury (by caries and by operative manipulation) as well as it can when this area of local inflammation is removed and nothing allowed to remain but uncontaminated (although possibly traumatized) pulp tissue. This possibility is indicated by the similarity in the degrees of success achieved through both forms of treatment.

Summary

1) The results of treatment of 83 teeth with carious pulp exposure by pulp capping are reported. 2) The dressing material was a suspension of calcium hydroxide and penicillin G in water, or in an aqueous suspension of methyl cellulose. The teeth were observed for a period of one year and more, to a maximum of 7 years and 4 months. 3) Apparently successful outcome of treatment was observed in 91 % of the cases. This compares favorably with results obtained by other

forms of treatment. 4) Since pulp capping is the least complex of the various methods advocated for treatment of the carious pulp exposure, it is reasonable to consider pulp capping with calcium hydroxide and penicillin as the treatment of choice for carious pulp exposure.

10 Taylor Place
Westport, Conn.

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Kenneth I. Lewis D.D.S.
1894–1956

As it must some day to all of us, death came on October 7th to Dr. Kenneth I. Lewis. He was a graduate of U.S.C. dental school in 1923, and was active in study groups, dental affairs and civic duties from that time. He was a charter member of the Baird Gold Foil Study Club and directed two study clubs of his own.

Dr. Lewis was a life member of the Southern California State Dental Association, and served as Treasurer and Councillor. He was an ardent supporter of the American Society of Dentistry for Children. During the struggling years of the Southern California Unit he aided by paying his dues many years in advance.

Dr. Lewis leaves his widow Dr. Elsie C. Schildwachter, also prominent in A.S.D.C., as well as a daughter Martha, and two sons Kenneth and Albert.

Ken was a quiet, friendly man who was devoted and loyal to his family, his profession and to his beliefs. May he rest in peace.

Unit News

Rhode Island

The R.I. Unit is boasting of its successful meeting of last May. A record of 120 dentists attended the all day meeting and this is remarkable because the total membership is 65. If an organization can get 100% to attend a meeting that is special but what about 200%? Man! that's something.

The following officers were installed.

Richard Deutch, Providence, *President*
Roger H. Brown, Cranston, *Vice President*
Ulysses T. Carter, Providence, *Secretary-Treas.*

Montana

Montana Unit did not report any activity other than the new slate of officers. Maybe their only activity is elections—anyway here are the results!

B. E. Kluge, Billings, *President*
R. K. Schroeder, Whitefish, *Vice President*
V. V. Crissey, Livingston, *Secretary-Treas.*

New York

The Fall meeting of the Metropolitan Unit was held at the N. Y. U. College of Dentistry October 15, 1956. An enthusiastic and large attendance heard Max H. Jacobs, M.D., D.M.D., assistant professor of Oral Diagnosis at Tufts University School of Dentistry, discuss the topic of "Oral Lesions in Childhood." A question and answer period and business meeting concluded a very successful evening.

Due to the outstanding way in which Dr. Joseph H. Kauffmann has given leadership to dental health education for the past thirty-five years, the Oral Hygiene Committee of Greater New York gave a testimonial dinner in his honor on Wednesday, November 14 at Hotel Fifth Avenue.

The meeting was well attended by friends and admirers of Dr. Kauffmann and they saw honor bestowed where honor was due.

Also at this gathering stimulation was given to further organized dentistry's program for "Dental Health Through Education."

Missouri

Neal Newton assured your editor that the Missouri Unit was not "daid" and sent along the following news. A meeting held in the Spring in Jefferson City produced the new officer slate.

Wm. S. Brandhorst, *President*
Leonard Rosen, *Vice President*
W. Neal Newton, *Secretary-Treas.*

The action of the Executive Council was directed toward a fine program and a membership drive. There will be a definite effort made to increase membership from 117 to 200. Best wishes.

Oregon

The Oregon Unit of A.S.D.C. held its last spring session on Tuesday, May 15th, in Portland. The first portion of the meeting was the presentation of a slide lecture by Dr. Maury Massler of Chicago, at the Dental School of the University of Oregon. This interesting and informative presentation was well received by the group. Dr. Massler presented his lecture on acute herpetic gingivostomatitis as differentiated from chronic recurrent oral aphthosis.

That evening, after a pleasant cocktail hour and dinner, a short business meeting was held at Berg's Chalet. The group then joined forces in the Medical-Dental Building Auditorium to hear Dr. Massler present some new information on the effects of various filling materials on the pulp. Dr. Massler's presentations were certainly masterful as always. A new slate of officers for 1956–57 was elected as follows:

Don Porter, Portland, *President*
Dan Haselnus, Portland, *Vice President*
Evelyn Strange, Portland, *Secretary-Treas.*
Frank C. Morris, Corvallis, *Editor*

The only hold-over officer was Evelyn Strange whom we think has done an excellent job with a time consuming task, and has certainly proved herself indispensable in the Unit.

Idaho

The first annual meeting of the Idaho Unit was held in conjunction with the State meeting on September 4 at Sun Valley. The new Unit was organized last spring by mail and has an initial membership of thirty-nine charter members.

The temporary officers who were appointed at that time and served during the organizing phase were:

Dr. W. A. Wilson, Boise, *President*
Dr. Frank Hyke, Lewiston, *Vice President*
Dr. Wesley Young, Boise, *Secretary-Treas.*
Dr. Vernon Nord, Wallace, *Editor*

The new officers elected at the annual meeting are:

Dr. R. D. Wilson, Lewiston, *President*
Dr. Winfield Jones, Boise, *Vice President*
Dr. Richard Hagerman, Wendell, *President-Elect*
Dr. Wesley Young, Boise, *Secretary-Treas.*
Dr. Vernon Nord, Wallace, *Editor*

The scientific part of the program was provided by Dr. David Law of the University of Washington who presented a very excellent talk covering many phases of pedodontic practice. The group plans to hold two meetings annually. The next meeting will be held at the time of the Boise mid-winter meeting, and the program will be provided by the members of the Society. Another meeting will be held with a clinician from out-of-state at the time of the annual meeting of the State Association next May.

Northern California

The N. California Unit was forced to forego the September business meeting for lack of an open date. The first annual seminar meeting is all set to go with 114 members signed up to attend in November. Robert Ricketts is the headliner of the all-day meeting.

Eddy Mack and Chuck Sweet, Jr. attended the national meeting in Atlantic City. Eddy as President of our chapter and Chuck as executive council member. Chuck has accepted the position as head man of the Department of Pedodontics at the University of Southern California.

In Contra Costa County, a new study club devoted to the advancement of dentistry for children has been organized. Lee Winters and others have worked hard to get this group under way.

New Jersey

The New Jersey Unit at its last meeting in Atlantic City elected the following officers for the ensuing year,

President: Dr. Francis Lehr, 1139 East Jersey Street, Elizabeth, N.J.
Pres-Elect: Dr. Saul M. Gale, 425 Clinton Place, Newark, N.J.
Vice-Pres.: Dr. H. Milton Cooper, 241 Main St., Hackensack, N.J.

Sec-Treas: Dr. Robert D. Moyer, 144 S. Harrison St., E. Orange, N.J.
Executive Committee: Dr. Wilfred Jordan, Dr. Edward B. Zlonczewski, Dr. Richard Ferguson.
Editor: Dr. H. Curtis Hester, Arcade Building, Glen Ridge, N.J.
Bus.-Manager: Dr. Paul M. Weber, Citizen's National Bank Bldg., Englewood, N.J.

The society acted as host for the annual meeting of the American Society of Dentistry for Children at Atlantic City on September 29 and 30th, and the following members played an active part.

Honorary Chairman, Sidney I. Kohn; General Chairman, Dr. Paul M. Weber; Co-Chairman, Louis E. Greenwald; Francis Lehr; President N.J. Unit ASDC-Local Arrangements, Harry R. Barber; Chairman, S. F. Reese; Nathaniel E. Friedrich Program, Francis Lehr; Chairman, Rodger E. Poole; Co-Chairman, John K. Heindel and Albert W. Theurer. Registration, Robert D. Moyer; Chairman, Wilfred W. Jordan; Entertainment & Dinner, Saul M. Gale; Chairman, H. Milton Cooper and C. Kermit Botkin. Publicity, H. Curtiss Hester, Chairman, and Donald N. Stryker.

The Unit was host at a cocktail party given in honor of Dr. Lawrence Burdge, a former president of our Unit and now President of the A.S.D.C.

Milt Cooper, program chairman, has made final arrangements for our mid-winter meeting. It will be held at the Robert Treat Hotel in Newark on January 9th, 1957. There will be table clinics at 2:30 P.M. by members after which there is a cocktail hour and dinner followed by the guest speaker.

Michigan

President Joe Cabot was proud of his program committee after a terrific start in Ann Arbor on October 9, where Maury Massler spoke on "Control of Rampant Caries and Pulp Protection of Carious Teeth".

The following meeting on December 5th, Walter C. McBride, a prophet who does have honor in his own country, shared the program with Harold Maxmen. Harold's topic was "Unpublished aids in Endodontics and Pedodontics." Walter's title was "More of the Same".

Maryland

At the last meeting of the Maryland Unit, a luncheon was given at the Lord Baltimore Hotel. A most interesting and informative talk entitled, "The Child as a Patient", was given by Dr. Jacob Harry Conn, who is the assistant Professor of Psychiatry at the Johns Hopkins University Medical School.

The following officers were elected to serve during the current year:

Donald Kramer, *President*
Benjamin Crosby Jr., *President-Elect*
Douglas Sanders, *Vice-President*
R. Kent Tongue Jr., *Secretary Treasurer*
Elected to the Executive Council:
Myron Price, Saul Blumenthal

Plans are now being made to have a principal speaker at the next annual meeting of the Maryland State Dental Association, to lecture on a phase of Dentistry for Children.

Pan American Council

Antonio Montero of Habana, Cuba reports as follows:

Activities of the Executives:

Meeting: Dr. Samuel D. Harris, founder of the Council, met with the President and the Secretary last July in Havana, discussing several matters, such as the next meeting of the Council sched-

uled for November 7–10, 1957. The By-Laws of this meeting will be sent to members as soon as possible.

Designation of Committee members: The President, Dr. Criner, has appointed the members for the different Committees established by our By-Laws. The Chairman of each Committee shall get in contact with the other members in order to start their activities.

Activities of the Affiliate Societies:

Canada: The CSDC (Canadian Society of Dentistry for Children) held its annual meeting last May 12, at the Royal York Hotel in Toronto. This society has a membership of more than 200, and organized a very interesting program, with a table-clinic session, with great emphasis given to the endodontic and orthodontic aspects of dentistry for children.

United States: The ASDC (American Society of Dentistry for Children) met in Atlantic City from the 28 to the 30th of September. The meeting was held at the Ambassador Hotel, and featured a television session from the Children's Hospital of Philadelphia organized by the medical-dental staff of that institution. There were also table-clinics given by groups from different schools, a Symposium on Preventive Dentistry and an attractive social program.

Mexico: The SMOI (Sociedad Mexicana de Odontología Infantil) is holding a monthly scientific session, taking part of the round table discussion held at the National Congress of Pediatrics. The society also took part in the program arranged with the occasion of the anniversary of the Dental School of Guadalajara.

Cuba: The SCOI (Sociedad Cubana de Odontología Infantil) held its annual meeting last March, nominating the new officers. There was an interesting scientific program that covered different aspects of the child's treatment, and also an exhibit of work done at the Children's Clinic of the Dental School, site of the meeting. The SCOI is working presently in the creation of a Children's Dental Health Day. This Society will act as Committee of Local Arrangements for the Council meeting next year in Havana.

Colombia: The SCOP (Sociedad Colombiana de Odontopediatría) has arranged lectures on Dental Economy in Pedodontics, Exodontics, etc. A group of dentists in Antioquie organized an affiliate society of the SCOP to function in Medellin. Presently the SCOP is working with the Public Health Dept. to improve dental services for children. This Society held its meeting last July 20–21.

El Salvador: La SSOI (Sociedad Salvadoreia de Odontología Infantil) was constituted last February, nominating Dr. Roberto Batista Mena as President and Victor R. Quehl as Secretary, P.O. Box 210, San Salvador.

Guatemala: The Children's Dentistry Study Club, headed by Dr. Guillermo Kepfer, Dean of the Dental School of San Carlos de Guatemala, joined the Council as an associate member.

REMEMBER

Next Meeting of the Council: *November 7–10, 1957, Havana, Cuba.* We count on the assistance of delegates from every Society.

TENNESSEE

L. W. Parker, Secretary of our Tennessee Unit, wrote us some time ago about this very active group as follows:

The annual meeting of the Tennessee Society of Dentistry for Children was held April 30, 1956, at the Peabody Hotel, Memphis, Tennessee, Dr. Chester Lloyd of Memphis presiding.

Dr. E. T. Coleman, Knoxville, Ten-

nessee is our new President and Dr. Paul O. Young also of Knoxville is our new Secretary-Treasurer.

Her Honor, Ruth McCain, Juvenile Court Judge of Memphis, was our luncheon guest speaker with a timely report of some of the problems of children.

Dr. George W. Teuscher of Chicago, presented our scientific program aimed at aiding the general practitioner in solving problems in dentistry for children.

We cordially invite all the friends of Tennessee and Dentistry for Children to join with us in our next annual meeting, May 1957, in beautiful and historic Gatlinburg in the Smokies.

Abstract

LAMBERT, L. H., JILLSON, O. W. Tronothane in Primary Gingivostomatitis. New England Journal of Medicine, **254**: 756–7, Apr. 19, 1956.

Tronothane Abbott has been found effective for symptomatic relief of herpetic gingivostomatitis. Anesthesia of the mucous membranes could be effected for 2 hours following topical application of the drug, allowing the child to eat and drink with reasonable comfort.

The repeated use of "caine" derivatives for the symptomatic relief of pain of oral lesions is unwise because of the possibility of toxic reactions manifested by tachycardia, muscular twitching, which progress to convulsions and death. Also, sensitivity to these valuable drugs may be acquired by topical use in the oral cavity.

Tronothane is structurally different from the other topical anesthetics available. Its toxicity is extremely low and primary sensitization appears to be negligible. Even though the drug appears to have a wide margin of safety, it should be prescribed in limited amounts to prevent its indiscriminate use.

The potential infectiveness of the disease was also studied and the conclusion drawn that herpetic gingivostomatitis is highly contagious in a susceptible population.

WILLIAM F. VIA, JR. D.D.S.

A Study of the Bacterial Flora of the Apical Portion of the Pulp Canal of Pulpless Infected Primary Teeth

DR. VIMLA SUD, B.D.S., M.S.D.

Editor's note:

Dr. Harold Wittich has provided us with the following information about Dr. Sud:

Born: January 22, 1922, Ludhiana, Punjab, India.

Education: New Delhi High School, 1937; Hindu College, New Delhi, 1939, F. Sc.; De Montmorency College of Dentistry, Lahore, 1944, B.D.S. Awarded special medal by the De Montmorency College of Dentistry, Lahore, for being the first lady graduate in dentistry in India.

Training after graduation: House Surgeon to the Punjab Dental Hospital, Lahore, 1944–1945. Fellowship at Eastman Dental Clinic, Rochester, Minn., U.S.A., 1949–1950. University of Minnesota School of Dentistry, M. S. degree, 1953–1955.

Research Experience: Research Assistant to the De Montmorency College of Dentistry, Lahore, 1946–1947. In charge Dental Section Research Unit, Refugee Camp Hospital Jullundur, Punjab, India, 6 months, 1947–1948.

Hospital Attachments and Professional Experience: Honorary Dental Surgeon, Medical College, Amritzar, Punjab, 6 months, 1948–1949, V. J. Hospital. Dental Surgeon to the District Hospital, Nahan, Himachal, Pradesh, 1 year, 1950–1951.

Teaching Experience: Lecturer in Dentistry to the Medical College, Agra, U. P., November 1951–1953.

A. E. S.

THE bacteriology of apical and periapical tissues is important because of the suspected relationship of pulpless teeth to focal infection, and also because infected primary teeth may damage their permanent successors. From the literature it appears that most of the bacteriological studies of this region have been based on the examination of extracted teeth. It is doubtful if a tooth can be extracted by ordinary methods without contaminating its apex with saliva; and it is by no means certain that contamination can be avoided even when the operator is meticulously trying to do so[1]. Bonnette writes that "it is little short of impossible to extract a tooth without exposing it to some source of contamination, either in the pumping action during the luxation, or from coming into contact with the gingival pockets which may be present"[2]. Rhoades and Dick made a study of bacteria that could be obtained from the apices of teeth following extraction. Twenty-nine pulpless teeth which were radiographically free from infection and fourteen control teeth with vital pulps were carefully removed and cultured. All of the pulpless teeth gave positive growths, but so did all the vital teeth with one exception[3]. These results certainly indicate the difficulty of extracting any tooth without contaminating the apical tissues.

Since the object of this study was to ascertain the true status of the prevailing bacteriological population at the apices of teeth, and was not concerned with the or-

ganisms present in the tooth structure itself, these studies were done taking cultures from the apical region through the root canal. Two techniques for this have been described by Appleton,[4] but the technique followed in this study is described below.

From the literature it also appeared that very little attention had been given to the study of anaerobic bacteria, and a number of important infections associated with anaerobes appear to have been neglected by clinical pathologists. Hayward[5] has given the following reasons for this attitude:

1. The technical difficulty of making anaerobic cultures. Anaerobes, especially the nonsporing types, are difficult to isolate on the simpler routine media.
2. The small number of well-defined clinical syndromes with which anaerobes are constantly associated, compared with their relatively frequent occurrence in mixed cultures in a number of ill-defined infective states.

Therefore, in this study cultures were made both aerobically and anaerobically with the specific objective of determining the extent and role of the anaerobes.

Material and Methods

Thirty-six children presented with abscessed primary teeth. One group of nine teeth with necrotic pulps had no associated fistular openings on the gingivae, and another group of 27 chronic abscessed teeth showed definite active fistulae.

Cultures were taken with sterile broaches on wire loops and streaked on blood agar plates containing 5% blood. The tooth was isolated, dried with air, and the contents of the pulp chamber removed from the carious or traumatized teeth. The length of the fine sterile broach was measured approximately with the radiographs, to find out the depth from which the sample was to be taken, and then inserted to this depth. Material on the broach tip was transferred then to the sterile loop which had been dipped in sterile distilled water. Two blood agar plates were inoculated by the streak method. One plate was incubated at 37°C aerobically for 2–3 days and the other anaerobically for 3–4 days.

Identification of the bacteria found was made by colony characteristics and by microscopy. The smears made on the slides were of various isolated colonies and one general smear. The staining used was Gram stain. When there was any doubt as to the identity of any colony, aerobic and anaerobic subcultures were made on blood agar plates.

Results

Briefly summarizing these results in Table I, alpha streptococci, diphtheroids and fusiforms were present in more than 50% of either the aerobic or anaerobic or both plates. Pneumococci, *Micrococcus pyogenes var. aureus*, *Neisseria catarrhalis*, Gram positive spore formers, vibrios and lactobacilli were present in from 10–50% of cases and the rest of the bacteria were in less than 10% of the cases.

In an additional analysis one group of nine cases which had no frank fistulae and the other 27 cases which had frank fistulae on the alveolar mucosa were compared. The findings were comparable on a percentage basis.

The anaerobic plates were much more putrescent than the aerobic plates. The number of organisms in anaerobic plates was never less than that of the aerobic plates, and in two-thirds of the cases there were many more. It should be

TABLE I

Type and Frequency of Micro-organisms Present in the Apical Areas in 36 Cases

	Percent Recovery Under	
	Aerobic Culture	Anaerobic Culture
1. Alpha hemolytic streptococci	81	61
2. Nonhemolytic streptococci	3	3
3. Streptococcus pyogenes (beta hemolytic)	3	5
4. Micrococcus pyogenes var. albus	19	14
5. Micrococcus pyogenes var. aureus	8	5
6. Pneumococci	19	3
7. Diphtheroids	58	36
8. Fusiform bacilli	*	69
9. Neisseria catarrhalis	19	11
10. Gram positive spore bearers	25	8
11. Coliform (Gram neg. rods)	8	*
12. Hemophilus parainfluenzae	3	*
13. Candida albicans	3	*
14. Actinomyces	3	3
15. Proteus (Gram neg. rods)	3	*
16. Vibrios	*	17
17. Lactobacilli	*	19
18. Micrococcus tetragenous	*	3

* Negative

remembered that the aerobic and anaerobic plates were so designated at random before incubation.

In eight anaerobic plates the colonies of anaerobic streptococci were black in color. On subculturing them aerobically and anaerobically, they reappeared on the anaerobic plates but did not grow in aerobic plates[6].

Discussion

These studies show that both aerobic and anaerobic bacteria could be cultured from apical areas of infected teeth. In the majority of cases, anaerobes were present in larger numbers than aerobes. This is not strange because conditions are suitable here for anaerobic growth, and also the anaerobes are found in more diverse situations both normally and in association with disease in man and animals[5]. The predominance of fusiforms (59%) and alpha streptococci (61%) on the anaerobic plates (Table I) should therefore not be a surprising finding.

Fusiform bacilli are found in the normal mouth, the upper respiratory tract, the intestine, and are seen in ulcerative processes of mucous membranes of the throat, abscesses of the liver, lung, gangrenous stomatitis and septicemia. Anaerobic streptococci are normal inhabitants of the oral cavity, the intestinal tract, and are associated with gangrenous disease of the viscera and found in septicemia.

The anaerobes produce the characteristic odor of root abscesses, as was illustrated by comparing the anaerobic plates with the aerobic plates. Whether the anaerobes are capable of initiating infections or whether they follow in the wake of aerobes, one cannot say, but in one case fusiforms were isolated in pure cultures, and it is tempting to give these organisms etiologic significance.

As shown in Table I, organisms of the alpha streptococcus group dominate all others (81%) in frequency of their presence in the infected canals in the aerobic plates. These results are similar to those of Stewart[7] who also made a bacterial study in root canals. Appleton[4a] states that streptococci, because of their invasive properties, probably induced the initial inflammation of the pulp. If the pulp succumbs, the invasive types of saprophytes can then survive and live in the necrotic tissues.

Grossman[8] mentions five routes which bacteria may take to reach the pulp tissues, viz. open cavity, extension from carious dentin, the gingival crevices,

extension of periapical infection from an adjacent tooth, and the blood stream.

The studies described here would indicate perhaps that in the bacteriology of teeth more investigation should be made of the anaerobic organisms present.

Summary

1. A study was made of the aerobic and anaerobic organisms present at the apices of infected primary teeth by direct cultures from root canals.

2. Alpha hemolytic streptococci and micrococci were commonly isolated, under anaerobic and aerobic conditions of incubation.

3. Anaerobic fusiform bacilli were more commonly isolated from apical abscesses of pulpless teeth than any other organism of etiologic significance.

4. Teeth with fistulae possessed the same type and distribution of organisms as did those without fistulae.

Acknowledgment

The author wishes to thank Dr. J. O. H. Tobin, Visiting Professor of Bacteriology and Immunology, University of Minnesota for his very kind help in studying the bacteriological findings. She is grateful to Dr. H. C. Wittich, Head of the Department of Pedodontia for sponsoring this study and to Dr. David F. Mitchell for his guidance in compilation of the results.

Snowdown, Simla 1,
India
% Dr. Devichaud
Director of Health Services

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Report*

To: The Officers and Executive Council, American Society of Dentistry for Children.

From: Ralph L. Ireland, Secretary, American Board of Pedodontics.

Subject: Report of the Board's Activities from September 1955 to September 1956.

The sixth examination given by the American Board of Pedodontics was held at the School of Dentistry, University of Michigan, February 2–4, 1956. This meeting was declared the annual meeting of the Corporation for 1956.

The following resolutions were passed by the Board:

1. "That the Board request the Council on Dental Education of the American Dental Association to extend the Board's waiver clause to include those dental students graduating during the year 1947, and also transmit to the Council the resolution passed by the Executive Council of the American Society of Dentistry for Children concerning the extention of the waiver clause." The Council on Dental Education was advised of the Board action on February 25, 1956. At the time of writing this report, a reply had not been received from the Council.

Editor's note:

The Council of Dental Education of the American Dental Association has approved the request of the American Board of Pedodontics for an extension of the waiver clause.

As a result of the Council's action the Board may now grant a waiver of the two year period of study after graduation to those dentists who graduated prior to December 31, 1947 and have since their graduation limited or directed their interest primarily to practice and/or teaching in the field of pedodontics.

A.E.S. December, 1956.

2. "That the American Society of Dentistry for Children be requested to subsidize the American Board of Pedodontics to the extent of at least one thousand ($1000.00) yearly in order to finance the activities of the Board. This financial assistance is requested in order to enable the Board to have a permanent executive secretary."
3. That the next meeting of the Board be held at the College of Physicians and Surgeons, School of Dentistry, San Francisco, California, July 25–27,1957.
4. The following officers were elected to serve until the next meeting of the Board.

   Chairman, Charles A. Sweet, Sr.
   Vice-chairman, Sidney I. Kohn
   Secretary-treasurer, Ralph L. Ireland

An analysis of the Board's six examinations accompanies this report.

* Presented to the Executive Council of the American Society of Dentistry for Children, September 28, 1956, at Atlantic City, N. J.

TABLE I

An Analysis of Six Examinations Given by the American Board of Pedodontics (1949–1956)

I.	Seventy-eight candidates have been examined by the Board.	
II.	Forty-eight (48) candidates have been certified by examination...	61.5%
III.	Thirty-seven (37) candidates were graded satisfactory in all areas at their first examination..	47.4%
IV.	Thirty-six (36) candidates were graded unsatisfactory in 1-3 areas at their first examination..	46.1%
V.	Four (4) candidates were graded unsatisfactory in 4 areas at their first examination..	5.1%
VI.	Eighteen (18) of the 40 candidates listed under 4 and 5 above have retaken the examination..	45.0%
	A. Sixteen (16) of the above 18 candidates retook the examination twice.	
	B. Two (2) of the above 18 candidates retook the examination three times.	
VII.	Ten (10) of the 16 candidates listed under 6A passed the second examination and were certified..	61.1%
VIII.	One (1) of the 2 candidates listed under 6B passed the third examination and was certified....	50.0%

TABLE II

An Analysis of Each Examination Given by the American Board of Pedodontics (1949–1956)

Year	No. of Candidates: First Exam	Second Exam	Third Exam	Results First Examination: Graded S in All Areas	Graded U in 1-3 Areas	Graded U in 4 Areas
1949	13			5	7	1
1950	13	4		5	7	1
1951	11	4	2	6	3	2
1953	17	1		10	7	
1954	11*	4		7	3	
1956	13	3		4	9	
Totals	78	16	2	37	36	4
				47.4%	46.15%	5.12%

* One candidate was graded S in 3 areas but did not turn in case histories.

TABLE III

An Analysis of Candidates Repeating the Examination (1949–1956)

Year	No. Candidates	Graded Satisfactory	Graded-Unsatisfactory
1950	4	2	2
1951	6—(2)*	4	1—(1)*
1953	1	1	1
1954	4	3	1
1956	3	1	2
Totals....	18—45%	11—61.1%	7—38.9%

* Candidates taking examination third time.

TABLE IV

An Analysis of Individual Areas of the American Board of Pedodontics Examination (1949–1956)

Year	Written	Oral	Clinical	Case Histories
1949.....	13 (3)	13 (4)	13 (6)	13 (3)
1950.....	13 (6)	13 (6)	13 (5)	13 (4)
Retakes...		1	4 (2)	1
1951.....	11 (3)	11 (4)	11 (4)	11 (4)
Retakes...	2	2 (1)	3 (1)	2
1953.....	17	17 (2)	17 (3)	17 (2)
Retakes...	1	1	1	
1954.....	11 (1)	11 (2)	11 (1)	11 (1)
Retakes...		1	2 (1)	2
1956.....	13 (2)	13 (3)	13 (4)	13 (4)
Retakes...	1 (1)	2 (1)	1 (1)	
Total No. Taken...	82 (16)	85 (23)	89 (28)	83 (18)
Per cent Passed...	80.49	72.94	68.54	79.52
Per cent Failed...	19.51	27.06	31.46	20.48

( )—No. of candidates graded unsatisfactory

Diplomates of the American Board of Pedodontics

Charter Members

1. John C. Brauer, Dean	School of Dentistry University of North Carolina Chapel Hill, North Carolina
2. Frank F. Lamons	250 Doctors Building Atlanta, Georgia
3. Ralph L. Ireland	College of Dentistry University of Nebraska Lincoln, Nebraska
4. Kenneth A. Easlick	School of Dentistry University of Michigan Ann Arbor, Michigan
5. Charles A. Sweet, Sr.	281 Lenox Avenue Oakland 10, California
6. Walter J. Pelton	U.S.P.H.S. Division of Dental Resources Washington, D. C.
7. Paul K. Losch	Children's Medical Center 300 Longwood Avenue Boston 16, Massachusetts
8. John M. Clayton	4711 Central Country Club Plaza Kansas City 12, Missouri
9. Ralph M. Erwin, Jr.	911 Selling Building Portland 5, Oregon
10. Samuel D. Harris	2306 David Broderick Tower Detroit, Michigan
11. Walter C. McBride	660 Fisher Building Detroit, Michigan
12. Ruth Martin	School of Dentistry Washington University 4559 Scott Avenue St. Louis 10, Missouri
13. Elsie C. Schildwachter	6831 Seville Avenue Huntington Park, California
14. Alfred E. Seyler	14615 E. Jefferson Avenue Detroit, Michigan
15. George W. Teuscher	Northwestern University Dental School 311 E. Chicago Avenue Chicago 11, Illinois

1949

1. Willard T. Hunnicutt	302 Medical Arts Building Atlanta, Georgia

2. Vincent M. Johnson	53 Sixth Street N. E. Atlanta, Georgia
3. Sidney I. Kohn	Trust Company of New Jersey Bldg. 921 Bergen Avenue Jersey City, New Jersey
4. Hugo M. Kulstad	1621 17th Street Bakersfield, California
5. J. R. Peabody	4705 Montrose Boulevard Houston, Texas

1950

1. Samuel Stulberg	17316 Livernois Avenue Detroit, Michigan
2. Bernard Z. Rabinowitch	5720 Wilshire Boulevard Suite 204 Los Angeles 36, California
3. David B. Law	School of Dentistry University of Washington Seattle, Washington
4. H. A. Zander	University of Minnesota Minneapolis, Minnesota
5. John M. Hughes	295 Scenic Ave. Piedmont, California
6. Irwin I. Beechan	2832 Summit Road Oakland 9, California

1951

1. J. J. Tocchini	455 Grand Avenue South San Francisco, Calif.
2. R. M. Way	414 Bondi Building Galesburg, Illinois
3. Harold Berk	Holmes Med. Building 471 Commonwealth Avenue Boston 15, Massachusetts
4. Carl Ellertson, Jr.	319 Homer Avenue Palo Alto, California
5. G. E. Waterman	8509 Broadmoor Drive Bethesda 14, Maryland
6. G. H. Rovelstad	110 S. DuBois Street Elgin, Illinois
7. Raymond Werther	Medical Tower 255 South 17 Street Philadelphia, Pennsylvania
8. E. F. Ritsert	School of Dentistry Temple University Philadelphia, Pennsylvania

9. M. M. Cohen	520 Beacon Street Boston, Massachusetts
10. Frank Nemec	1 Flint Building Auburn, New York
11. Joseph T. Hartsook	111 E. Stadium Boulevard Ann Arbor, Michigan

1953

1. William Brown	School of Dentistry University of Michigan Ann Arbor, Michigan
2. William Demeritt	School of Dentistry University of North Carolina Chapel Hill, North Carolina
3. Lyonel Hildes	6 Chester Avenue White Plains, New York
4. Sidney Kronfeld	36 E. 36th Street Brooklyn 2, New York
5. Earl Lampshire	709 Sharp Building Lincoln, Nebraska
6. Charles J. Mehlum	550 W. Thomas Road Phoenix, Arizona
7. Ralph E. McDonald	1121 West Michigan Street Indianapolis, Indiana
8. William Seims, Jr.	405 Center Street Yuba City, California
9. Bernard Smith	447 29 Street Oakland, California
10. Corvin F. Stine	636 Church Street Evanston, Illinois
11. Paul F. Sydow	29 Lincoln Street Framingham, Massachusetts

1954

1. Melvin A. Noonan	630 N. Woodward Ave. Birmingham, Michigan
2. Hugh M. Kopel	19933 Livernois Avenue Detroit 21, Michigan
3. Thodore Suher	29 N. W. 23rd Place Portland 10, Oregon
4. Edwin Froelich	1832 State Street Santa Barbara, California
5. John E. Gilster	4660 Maryland Ave. St. Louis 10, Missouri
6. Cyril T. Havey	662 S. Western Avenue Los Angeles 5, California

7. Roland Renard Hawes	Eastman Dental Dispensary 800 Main Street East Rochester 3, New York
8. Frederick R. Shiere	Tufts College Dental School 136 Harrison Avenue Boston 11, Massachusetts
9. Joseph F. Burket	School of Dentistry University of North Carolina Chapel Hill, North Carolina

1956

1. Roy L. Lindahl	School of Dentistry University of North Carolina Chapel Hill, North Carolina
2. Elias Lisman	1034 Clinton Avenue Irvington 11, New Jersey
3. Edward S. Mack	Stonestown Medical Building 20th and Buckingham Way San Francisco, Calif.
4. Donald R. Porter	5712 S. W. Nebraska Portland, Oregon
5. Isidore M. Samuels	8 Gramercy Park New York 3, New York
6. Laren W. Teutsch	4201 Farnam Omaha, Nebraska

A Case History of Hemophilia

H. O. Simmons Jr., D.D.S.

PATIENT: K. B., Age 6, (November 4, 1949)

K. B. was first seen in our office on November 14, 1955 with an acute abscess over the upper right central incisor (primary). Visual examination revealed that the upper right primary central incisor was very carious and broken off at the gingiva. The abscess had pointed over the apex of the infected tooth. The abscess was drained, and the remaining root tip was removed by catching it with an explorer tip. Drainage was good and bleeding stopped in about fifteen minutes. Recovery was slow due to prolonged oozing. Appointment was made for full mouth x-rays.

The parents gave a history that the child had had a splenectomy on 13 March 1951. Hospital records were obtained and a diagnosis of Thrombocytopenic purpura was made. The operation had been performed in an attempt to alleviate the symptoms of the Thrombocytopenic purpura. The recovery was very slow and frequent whole blood transfusions were required on 1-24-51, 2-16-51, 3-13-51, 3-19-51, 3-20-51, 3-21-51, 3-31-51, 4-9-51, and 4-10-51. Blood type is A Rh Neg.

Past History of Patient

Chief Complaint: Bruises easily.

Present Illness: Left ankle had been bothering him for two days. The same thing occurred about one month ago. Mother rubbed it with alcohol and applied heat. Unable to walk on ankle. No temperature. Bowels O.K. Restless at night. Blood taken from left arm Tuesday. Mother noticed swelling and a bruise in the middle of the night. Cried with arm that night and next a.m. Free bleeder since birth. Was circumcised at the Plains Hospital when he was 7 days old. Was kept in hospital 3 days because of bleeding.

Past History:

Medical: Neg
Surg: Bleeding at circumcision
Family History: Mother living and well age 21.
Father—living and well age 23.
No siblings.
No familial diseases.
Physical Exam: 18 month white male, thin, appearing chronically ill. Weight 20¾ pounds.
Head: Negative
ENT: Negative
Neck: Normal
Chest: Normal
Heart: Normal, no murmurs.
Lungs: Clear to P & A
Abdomen: Normal—Spleen not palpable
G.U.: Negative
Neurological: Negative
Extremities: Multiple ecchymosis with swollen knee joints.
Diagnosis: Thrombocytopenic Purpura.

Laboratory Reports:

Urine: Essentially negative on 1-24-51, 3-12-51.
Blood:
1-23-51 RBC 5,080,000. Coagulation 11 min. Bleeding Time 5 min. Clot Retraction: Very slight at 24 hours. Platelet Count: 50,800 per cu. mm. (Normal 250,000 to 500,000) Prothrombin: 14 seconds 93% Norm.
1-25-51 RBC 6,430,000. Hemo. 88%. Coagulation 5 min. Color Index 0.7. Bleeding Time 4 min. Platelet count: 160,750 per cu. mm.

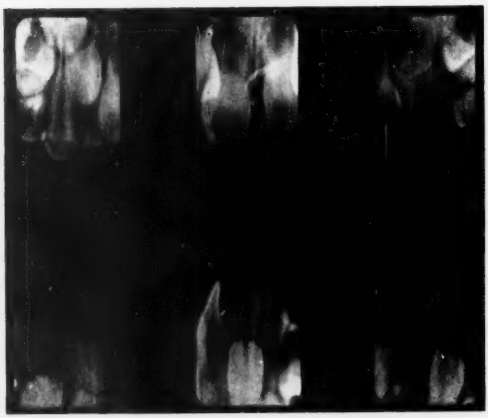

Fig. 1. Anterior region

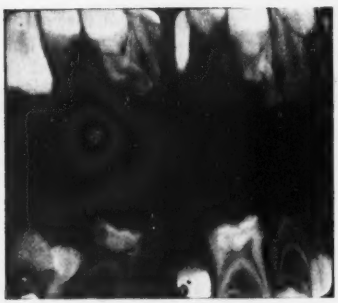

Fig. 2. Left posterior region

Fig. 3. Right posterior region

2-16-51 RBC 4,930,000 Platelet count: 142,870 per cu. mm.

2-17-51 Platelet count: 212,940 per cu. mm.

3-12-51 Blood: red cells 4,590,000; white cells 13,200; Hemo. 76%; color index 0.85. Total Neutrophiles 36%. Eosinophile 0; basophile 0; myelocyte 0; juvenile 0; staff 0; segmented 36; lymphocyte 64; monocyte 0.
Pathological Forms of Red Cells: Macrocytes none; Microcytes none; megaloblasts none; normoblasts none; poikilocytes none; polychromatophilia occasional; stipples none; parasites none. Platelet count: 266,220 per cu. mm.

3-14-51 Platelet count: 233,550 per cu. mm. Red Cells 5,190,000. Hemo. 94%. Color Index 0.9

3-15-51 RBC 2,990,000; White Cells 15,950; Hemo. 46%; Coagulation 9 min.; Color index 0.79; Bleeding Time 2 min. Total Neutrophiles 75%. Staff 28; Seg. 47; Lymph. 22; Mono. 3.
Pathological Forms of Red Cells: Macrocytes number; Microcytes occasional; Megaloblasts none; normoblasts none; poikilocytes occasional: polychromatophilia very occasional; stipples very occasional; parasites none. Platelet count: 348,500 per cu. mm.

3-16-51 RBC 5,270,000; Hemoglobin 84%; Color Index 0.8.

3-17-51 RBC 5,040,000; Hemoglobin 82%; Color Index 0.8. Platelet count: 282,240 per cu. mm.

3-19-51 RBC 2,950,000; Hemoglobin 50%; Color Index 0.9. Platelet count: 100,300 per cu. mm.

3-20-51 RBC 2,930,000; Hemoglobin 38%; Color Index 0.65. Platelet Count: 126,420 per cu. mm.

3-21-51 RBC 2,620,000; Hemo. 44%; Color Index 0.84. Platelet count: 296,060 per cu. mm.

3-22-51 RBC 4,670,000; Hemo. 90%; Color Index 0.98; WBC 48,000. Total Neutrophiles 74%. Pathological Forms of Red Cells: Polychromatophilia very large number. Marked Toxic Granulation. Platelet count: 165,450 per cu mm.

3-23-51 RBC 4,650,000; Hemo. 90%; Color Index 0.9. Platelet count; 399,900 per cu. mm.

3-25-51 RBC 4,150,000; Hemo. 84%; Color Index 1.02. Platelet count; 270,000 per cu. mm.

3-26-51 RBC 5,030,000; Hemo. 94%; Color Index 0.94. Platelet count: 261,560 per cu. mm.

3-27-51 RBC 5,010,000; Hemo. 102%; Color Index 1.0. Platelet count: 275,530 per cu. mm.

3-28-51 RBC 4,680,000; Hemo. 78%; C.I. 0.84. Platelet count: 210,600 per cu. mm.

3-29-51 RBC 5,030,000; Hemo. 96%; C.I. 0.9. Platelet Count: 311,860 per cu. mm.

3-30-51 RBC 4,460,000; Hemo. 80%; C.I. 0.9. Platelet count: 191,780 per cu. mm.

3-31-51 RBC 2,860,000; Hemo. 58%; C.I. 1.0. Platelet count: 77,220 per cu. mm.

4-1-51 RBC 4,300,000; Hemo. 84%; C.I. 0.9. Platelet count: 184,900 per cu. mm.

4-2-51 RBC 4,330,000; Hemo. 86%; C.I. 1.0. Platelet count: 246,810 per cu. mm.

4-3-51 RBC 5,180,000; Hemo. 100%; C.I. 0.9. Platelet count: 414,400 per cu. mm.

4-4-51 RBC 4,910,000; Hemo. 98%; C.I. 1.02. Platelet count: 312,240 per cu. mm.

4-5-51 RBC 4,200,000; Hemo. 80%; C.I. 0.9. Platelet: 210,000 per cu. mm.

4-6-51 RBC 3,840,000; Hemo. 74%; C.I. 0.98. Platelet count: 234,000 per cu. mm.

4-7-51 RBC 3,680,000; Hemo. 72%; Color Index 1.0. Platelet 368,000 per cu. mm.

4-8-51 RBC 4,010,000; Hemo. 70%; C.I. 0.87. Platelet count: 485,210 per cu. mm.

4-9-51 RBC 3,680,000; Hemo. 70%; C.I. 0.9. Platelet: 614,560 per cu. mm.

4-10-51 RBC 4,200,000; Hemo. 74%; C.I. 0.88. Platelet: 571,200 per cu. mm.

4-12-51 RBC 4,050,000; Hemo. 74%; C.I. 0.9. Platelet: 550,800 per cu. mm.

4-13-51 RBC 4,720,000; Hemo. 84%; C.I. 0.89. Platelet: 783,520 per cu. mm.

4-14-51 RBC 5,010,000; Hemo. 90%; C.I. 0.9. Platelet: 641,280 per cu. mm.

6-12-51 RBC 4,740,000; Hemo. 82%; C.I. 0.88; WBC 18,300. Total Neutrophiles 27%. Pathological Forms of Red Cells: None. Occasional young lymphocytes. Platelet: 322,320 per cu. mm.

11-18-53 RBC 3,450,000; Hb 8.5 gms.; WBC 23,684. Staff 4; Segs 78; Tot. Neut. 82%; Lymphs 18. Six neucleated red cells, slight hypochromia, many macrocytes and poikilocytes, occasional polychromia. Coag. time: 6 min. Bleeding time: 5 min. Platelet 150,000.

11-19-53 RBC 4,330,000. Hb. 13 gms.

Bone Marrow:

1-29-51 Sternal bone marrow: Myelocytes 17; Juvenile 22; Neutrophiles 31; Lymphocytes 19; Normoblasts 11. Remarks; Megakaryocytes are present in the smear but seem to be moderately reduced in number. These cells fail to show the usual degree of platelet production in their cytoplasm. The findings would not favor essential thrombocytopenic purpura, where usually an increase in megakaryocytes is observed. Also the marrow findings will lend no support to the possibility of aleukemic leukemia, or aplastic anemia, which are conditions that may be associated with thrombocytopenia of childhood. The evidence would seem to favor one of the secondary types of thrombocytopenia, even though this is difficult to correlate with the apparent congenital history. (Reported from Terrell Laboratories) Differential Count: Eosinophile 3; Staff 1; Segmented 46; Lymphocyte 42; Monocyte 8. Macrocytosis none; microcytosis none; hypochromia

slight; poikilocytosis none; polychromasia none; parasites none found; stippling none; nucleated red cells none. Remarks: Normal red cell morphology, except for slight degree of gypochromia. No abnormal white cells found.

X-ray:

1-23-51 X-ray of Left Ankle: Left ankle, effusion in the joint.

11-18-53 X-ray of Abdomen: The pro-peritoneal line appears to be quite widened. This suggests retroperitoneal hemorrhage only in the right flank displacing the bowel medially.

Operation: On March 13, 1951 the spleen was removed; upon opening of the cavity (abdominal) the spleen was found to be apparently normal in size and a deep red in color.

Course in Hospital: Stormy, required repeated blood transfusions of fresh whole blood on:

1-24-51 150cc
2-16-51 200cc
3-13-51 200cc
3-19-51 250cc
3-20-51 250cc
3-21-51 250cc
3-31-51 500
4-9-51 100
4-10-51 400cc

4-4-51 Protamine Titration: Patient's End Point: 0.28 mg of Protamine; Control: 0.12 mg of Protamine: Normal: 0.14 mg. of Protamine.

On November 17, 1953, Patient had a recurrence of spontaneous hemorrhage. At this time he was diagnosed as a probable hyperheparinemia. The patient was placed on Toluidene Blue, I.V. This therapy was fortified with fresh whole blood transfusions and Protamine Sulfate (50 mg I.V.). He continued to improve and was discharged from the hospital.

(In May 1955, R. J. Speer, PhD.,[1] and Joseph M. Hill, M.D., reported on a case of true hyperheparinemia and its successful treatment. In 1947 Allan[2] and associates called attention to the peculiarities of the bleeding tendencies in thrombocytopenic purpura and postulated that this condition was due to an increase of a "heparin-like" substance in the blood. In 1948 Allan and Jacobson[3] reported that hyperheparinemia could be produced in dogs by over-irradiation. They stated as in thrombocytopenic purpura that the toluidene blue and protamine sulfate neutralized the "heparin-like" anti-coagulant which resulted in an improved control of the hemorrhagic condition.)

On November 17, 1953, K. B. was given another whole blood transfusion to increase his hemoglobin and the clotting time. The patient was not seen by his pediatrician since the transfusion until referred by this office for check-up on November 14, 1955. The laboratory work performed in our local hospital (Methodist Hospital) showed a prolonged clotting time which was still prolonged after two weeks of medication (see previously mentioned report).

On November 16, 1955 full mouth x-rays were done: the patient was referred to his pediatrician for a work-up and clearance. At this date there was still a slight oozing from the area of the exfoliated central incisor; the area that was incised and drained showed good approximation and healing with *no* oozing of blood.

Laboratory report of 11-14-55 is as follows:

Bleeding time: 1 minute and thirty seconds
Coag. Time: finger stick—17 minutes
Coag. Time: venous puncture—7 minutes
Clot retraction: 1 hour and 10 minutes

Laboratory report of 11-28-55:

Lee and White Coag time.
1st tube: 50 minutes—partial clot
2nd tube: No clot formed
3rd tube: 70 minutes—partial clot.
Platelet count: 460,000

K. B. was then referred to Dr. Joseph Hill, Wadley Blood Center, Dallas, Texas for a work-up and diagnosis. On December 5, 1955, Dr. Hill made his examination and report as follows:

Specimen:

To be examined for: Coagulation factors.

Report:

Lee and White clot time—greater than 1 hr.

Proaccelerin—91% of normal.

Proconvertin—84% of normal.

Prothrombin—79% of normal.

Prothrombin utilization—15% utilized.

Prothrombin utilization with AHG added—61% utilized.

Prothrombin utilization with normal serum (PTC & PTA) added—less than 5% utilized.

Prothrombin utilization with adsorbed serum (PTA) added—15% utilized.

Recalcification time and mixing test for anticoagulants:

Normal—7.5 min. clot time.

Patient—47.5 min. clot time.

½ normal and ½ patient—7.5 min. clot time.

Thromboplastin generation test:

Plasma	Serum	Platelets	Results
Normal	Normal	Normal	Normal
Patient	Patient	Normal	Abnormal
Normal	Patient	Normal	Normal
Patient	Normal	Normal	Abnormal

Conclusion: AHG deficient.

Diagnosis: *Hemophilia, AHG deficient.*

Dr. Hill's recommendation was that whole fresh blood transfusions be given and if the clotting time returned to normal, the necessary dental work should be done under general anesthesia.

On December 21, 1955, I was called to see this patient in Methodist Hospital. He had fallen in the bath tub two days previous and had injured his mouth. Visual examination revealed a lacerated upper labial frenum and the upper lip. One ampule of "Hyland" anti-hemophilic plasma was given I.V. to control the hemorrhage. At 2:00 AM on the 12-22-55 there was another spontaneous hemorrhage. On 12-23-55 another transfusion of fresh whole blood (200 cc) was given. He was allowed to return home for Christmas. On 12-28-1955 there was a spontaneous hemorrhage from the lacerated frenum. Bruises on the leg and ankle indicated spontaneous hemorrhage into the tissues. He was rehospitalized on 12-28-55 and hemorrhage controlled by pressure. On 12-30-55 there was another acute alveolar abscess that developed at apex of the lower right 1st and 2nd primary molars. Antibiotics were given orally. A transfusion of fresh whole blood (200 cc) was given and this was repeated on 1-2-56. There was no further hemorrhage after the first transfusion. Arrangements were made for the patient to be transferred to Wadley Blood Center in Dallas, Texas.

On the third of January 1956 the patient was transferred to Baylor Hospital, Wadley Blood Center, Dallas, Texas for treatment by Dr. Joseph Hill to control the bleeding. Dr. Charles Yates of Dallas, Texas completed the operative and surgical procedures on K. B. under general anesthesia. Stainless steel crowns were placed upon the four primary cuspids, lower left second primary molar and upper right first primary molar. A mesial occlusal silver amalgam restoration was placed in the upper right second primary molar; an occlusal-buccal silver amalgam restoration was placed in the lower right first permanent molar. The following teeth were extracted: upper right lateral and central incisors (primary), upper left

lateral (primary), upper left first and second primary molars, lower left first primary molar, lower left lateral incisor (primary), and lower right first and second primary molars. Prior to the dental surgery the patient was placed on *fresh* whole blood transfusions and on the day of surgery he was given two ampules of anti-hemophilic plasma. The first post-operative day, the patient was given another ampule of anti-hemophilic plasma. The recovery was excellent, healing was normal, and there was no further hemorrhage.

On May 18, 1956 upper and lower partial dentures were placed to restore function and esthetics. The patient was last seen on June 29, 1956. The mouth was still in excellent oral hygiene, function has been restored, and the patient had improved in health.

2350 34th Street
Lubbock, Texas

1. Speer, R. J., Ph.D. and Hill, Joseph M., M.D. and others: Journal of Laboratory and Clinical Medicine. Vol. 45, No. 5, pp 730-739, May 1955.
2. Allan, J. G., M.D., and others: Journal of Experimental Medicine. Vol. 87, pp 70-85, 1948.
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